CHAPTER 2

GROUND MOUNTED SIGN INSTALLATION

Introduction

The installation of ground mounted signs involves the furnishing of approved materials, and the erecting of traffic supports and signs according to the Standard Specifications and the Contract plans. In this chapter the installation of ground mounted signs will be broken down into pre-construction, construction inspection, and measurement and payment duties.

Sign locations
802.03

It is important for the technician to do his homework and to anticipate any problem areas in the plans and proposal before they become the controlling operation. If the technician is unfamiliar with ground mounted sign installation, the following items need to be reviewed:

Traffic Signs
913.10

* Sections 802, 910.14, and 911.02 of the current Standard Specifications.
* "Standard Highway Signs", and FHWA publication. To order write: U.S. Department of Transportation FHWA 400 7th St. W. Washington, D.C. 20590. Attention: Superintendent of Documents, Request: Standard Highway Sign Booklet 1979.
* Indiana Manual on Uniform Traffic Control Devices for highway construction and maintenance operations. Located on pages 37-40.

Pre-Construction Duties

Generally speaking, sheet signs are mounted on square posts and panel signs are mounted on structural steel posts. The technician needs to familiarize himself with both the plan sheets and the quantity sheets of the contract plans to determine what kind of sign and support goes where. Before any work is started on a contract and preferably before the pre-construction conference, the following items need to be considered:

* The R/W distances as shown on the plans need to be checked. This may usually be accomplished by reviewing "old road plans" held by the District Development Department.

Shop Drawings 802.04

* Closely examine the sign shop drawings. The dimensions as shown on the shop drawings will override the dimensions as shown on the plan and quantity sheets.
* Each sign location needs to be field checked. The following procedure should be followed for each sign location:
    * Locate the station or mile designation as shown on the plans.
    * Verify that the location is acceptable for the visibility of the driver on the main line pavement and does not block the view of any driver on the approaches.

Installation of Signs 802.08

* Paint the sign designation, as it appears on the plans, at the edge of the pavement. Do not paint over the white edge if edge line re-stripping is planned before sign installation.
* Calculate and locate the horizontal offset from the edge of pavement to each sign support for the purpose of checking the sign support lengths as shown in the quantity sheets. Some calculations will be required since the distances are usually given to the edge of the sign.

Remove and Reset Reference Signs 802.10

* Refer to the sheet sign shop drawing hole punching details, which accompany the plans, for spacing of
    * the channel posts.

  Refer to the panel sign shop drawings for the panel sign size. The supports will be located at the 1/5 and 4/5 points of the panel size.

* Do not permanently mark this location because that is the responsibility of the contractor after all the utilities have been located.
* The vertical distance between the edge of pavement and ground level at each sign support needs to be calculated. A string level or a hand-held level work nicely for this operation.

Pre-Construction Duties (cont'd)

* For Square Posts: Length of Sign Supports = (Embedment Length)+(Sign Clearance Above Edge of Pvt.)+(Height of Sign From The Shop Drawings)+/-(Vertical Distance Between Edge of Pavement And Ground Level Of Sign Support)
* For structural steel posts: Length of Sign Support = (Sign Clearance Above The Ground) + (Height of Sign From The Shop Drawings + 2 inches) – (Break-away Stub Height Above The Ground) +/- (Vertical Distance Between Edge of Pavement And Ground Level Of Sign Support). See Standard 802-SNGS-10

Removal & Relocation 802.09

* A summary table needs to be prepared comparing the support lengths as shown in the quantity sheets with the support lengths as determined from field measurement. This table will be used for the following purposes:

    * To check the Contractor's calculations on the procedure described above.
    * To prepare any change orders necessary to cover any quantity changes in either channel posts or structural steel posts.
    * To alert Central Office Traffic Design of incorrectly sized structural steel if the field calculated structural steel post lengths exceed planned by more than 2 or 3 feet.

Construction Inspection Duties

After all utilities have been located, it is the contractor's responsibility to stake the locations of all sign supports. All signs will be placed at the proper elevation above the edge of pavement, and at the proper offset. They will also be level and oriented correctly. The project personnel shall be given no less than two days notice in advance of any staking of inspection required.

This section will be broken down into inspection of channel posts and sheet signs, and structural steel posts and panel signs.

Installation Of Channel Posts

When inspecting the installation of channel posts the following items need to be considered:

* The Basis For Approval for steel flanged channel posts will depend upon the quantity used. Refer to the latest edition of the Frequency Manual for the frequency of samples and tests.
* All posts must meet utility clearance requirements.
* No portion of a sign may overhang the R/W line.
* Posts should not be driven in a ditch line.

Installation Of Channel Posts (cont'd)

* Posts shall be driven to the depth as shown on the sign detail sheets. (Example: 42" minimum).
* Posts shall be installed plumb.
* Back to back posts shall be bolted together and driven simultaneously.
* For a two post installation, the second post shall be leveled to the 1" holes of the first post driven in order for the sign to be placed level.
* Any post bent, damaged, or unfit for use in the finished work shall be removed from the site and replaced with an acceptable post with no additional payment.

Installation Of Sheet Signs

When inspecting the installation of sheet signs, the following items need to be considered:

* The Basis For Approval for traffic signs will be a Type C Certification. (W #)
* Sheet signs shall be installed level on the channel posts.

Reflective Sheeting 913.10

* Sheet signs shall be fastened to the channel posts as follows:
    * Place a plastic washer against the sign face with a metal washer.
    * Insert a bolt through the metal washer against the plastic washer, the sign face, the post, the lock washer, and the nut.
* After the bolts have been hand tightened snug, the bolt head should be held by a wrench to prevent any movement of the washer or bolt head while the nut is being tightened.
* Do not over tighten the nut to prevent twisting of the sign sheeting or denting of the sign metal. Refer to Standard 802-SNGS-04 & 07.

Installation

When inspecting the installation of structural steel wide flange (WF) posts,

Of Structural Steel Posts

the following items need to be considered:

* The Basis For Approval for structural steel will be a Type C Certification. The Basis For Approval for reinforcing steel will be the “J” number The Basis For Approval for the concrete will be the sequence number reported on the IT-652.
* The foundation excavation shall be completed to levels and dimensions as shown in the plans.
    * If bed rock or boulders are encountered during excavation, they shall be removed to the depth on the plans.
    * The contractor may use a foundation casing if unstable soil conditions are anticipated or encountered.

* Excavated material not used in the backfill shall be removed within 24 hours.
* For foundations over 5 feet deep, a tremie will be used until the concrete is within 5 feet of the top of the foundation.
* The concrete shall be finished flush with the finished grade.
* The break-away wide flange (WF) stubs shall be placed plumb and to the proper height above the finished grade as shown on Standard 802-SNGP-01. If the top of the break-away stub is level, the upper posts should not need shimming.

STRUCTURAL STEEL POST ON A
BREAK-AWAY STUB SET IN CONCRETE

(4” MAX. IS CRITICAL FOR PROPER BREAK-AWAY)

Instl. Of Str. Steel Posts (cont’d)

* The break-away stubs shall be installed prior to ordering the posts. This means that the final length of the break-away posts shall be determined by using the difference in elevation between the edge of pavement and the top of the break-away stub.
* The break-away posts shall come to the job site assembled and torqued to the design specifications.
* The break-away posts shall be installed plumb, using the proper bolts, washers, and nuts, and in the proper sequence as shown on Standard 802-.SNGP-02
* The back plates shall be level between post #1 and post #2.

Instl. Of Panel Signs

When inspecting the installation of panel signs, the following items need to be considered:

* The Basis For Approval for panel signs is a Type C Certification.
* Panel signs shall be installed level on the wide flange (WF) posts, and shall be placed a minimum of 1” above the fuse plate as shown on Standard 802-SNGP-06
* The 1/5 and 4/5 points of the sign should be marked and should correspond with the centers of the wide flange posts.
* Panel sign clips shall be attached to each sign support as follows:
    * The top and bottom of the panel sign will be clipped to both sides of the wide flange post.
    * The intermediate clips at one foot spacing will be staggered on either side of the wide flange post.

PANEL SIGN ON STRUCTURAL STEEL POSTS

Instl. Of Panel Signs (cont'd)

* If a secondary panel sign, such as an exit sign, is mounted on top of the primary panel sign, two type B channel posts will be used to support the secondary sign. The length of these Type B channel posts will be 3 feet plus the height of the secondary sign. Sign clips will be attached as described above.

Measurement And Payment 802.10 , 802.11 & 802.12

Proper measurement and documentation of the installed ground mounted sign and support is essential for the following:

* Maintaining the progressive estimate.
* Paying the contractor.
* Filling out the material records.
* Completing the final construction record.

Items used in the installation of ground mounted signs are measured and paid for as follows:

* Concrete dimensions shall be measured along neat lines and paid for by cubic yard.
* Reinforcing steel shall be measured by the length and paid for in pounds after conversion according to Section 703.08.
* Structural steel shall be measured by the length and paid for in pounds after conversion. The weights of the base stiffener plates, fuse plates, and back plates shall be added to the weight of the posts according to the Misc. Standard Sheet.
* Channel posts shall be measured by the square foot and paid for to the nearest foot.
* Sheet signs shall be measured by the square foot as determined by the maximum length and width of the sheet metal required to produce the sheet sign.
* Panel signs, including legend and/or copy, shall be measured and paid for by the square foot. Where sheet signs are placed on panel signs, they shall be measured and paid for separately.
* Sign hardware necessary to mount signs to existing or new ground mounted sign structures shall be included in the bid price for the sign face.